

1. Using the periodic table as a guide, determine the atomic number and then the number of protons in each of the following:

hydrogen fluorine bromine copper tin

2. If an atom of iron has 28 neutrons,
a. What is its atomic number?
b. What is its mass number?
3. Determine, for each of the following, the number of protons, electrons, and neutrons as well as the name of the element:

15	33	63	86	130	186	202
N	S	Cu	Sr	Ba	W	Hg
7	16	29	38	56	74	80

4. Consider the following:

1	2	3	
H	H	H	Are these substances isotopes? Why or why not?
1	1	1	

hydrogen deuterium tritium

5. With the exception of hydrogen, isotopes of elements are identified by their mass numbers. For example, *uranium-235* and *uranium-238* are representations of the following:

235	238	Write the standard notation for the following isotopes:			
U	U				
92	92	chlorine-37	boron-11	gold-197	carbon-13

6. Copper, a metal known since ancient times, is used in electrical wires and pennies, among other things. The atomic masses of its two stable isotopes, Cu-63 (69.09% abundant) and Cu-65 (30.91% abundant) are 62.93u and 64.9278u respectively. Determine the average atomic mass for copper.
Answer: 63.55u
7. The atomic masses of the two isotopes of boron, boron-10 (19.78%) and boron-11 (80.22%) are 10.0129u and 11.0093u respectively. Determine the average atomic mass for boron.
Answer: 10.81u

8. You have been given an unknown element. You perform the appropriate measurements and discover that it consists of three isotopes. Isotope 1 (90.51% abundant) has an atomic mass of 19.992u, isotope 2 (0.27%) has an atomic mass of 20.994u and isotope 3 (9.22%) has an atomic mass of 21.990u. Determine the average atomic mass and then use this value in conjunction with the periodic table to identify it.

GET TOGETHER IN GROUPS OF THREE.

YOU MUST SOLVE ALL OF THE QUESTIONS SHOWN BELOW. This page is marked out of 10.

ALTHOUGH YOUR GROUP WILL SUBMIT ONE SET OF ANSWERS TO ME, EVERYONE IN THE GROUP MUST HAVE THE SOLUTIONS DONE IN THEIR NOTEBOOK (you must show me!)

YOU ARE GIVEN 3 BONUS MARKS. EACH TIME YOUR GROUP ASKS A QUESTION, YOUR GROUP FORFEITS ONE BONUS MARK. BEFORE ASKING THE QUESTION, YOU WILL HAVE TO DECIDE WHETHER IT IS WORTH IT TO GIVE UP THE BONUS MARK. *NOTE: If you do not ask any questions, and one of the answers is wrong, you give up all bonus marks.*

9. Calculate the average atomic mass of chlorine if it consists of 75.77% chlorine-35 (34.97u) and 24.23% chlorine-37 (36.95u).

10. Magnesium, a low-density metal used in alloys, has three isotopes: *magnesium-24*, *magnesium-25* and *magnesium-26*. Their relative abundances are 78.99%, 10.00% and 11.01% and their atomic masses are 23.985u, 24.986u and 25.983u respectively. Calculate the average atomic mass of magnesium AND determine the number of protons, electrons and neutrons in *magnesium-26*.

11. An element has two naturally occurring isotopes with the following masses and abundances:

84.9118u (72.15%) and
86.9092u (27.85%)

What is the avg atomic mass and name of the element?

12. Another element has naturally occurring isotopes with the following masses and abundances:

27.977u (92.21%)
28.976u (4.70%)
29.974u (3.09%)

What is the identity of this element? Show your work.

13. *OK, something a little different here. Nothing to do with isotopes and average atomic masses.*

Two separate samples were analyzed in the lab and the following results were obtained:

	Amount of Phosphorus	Amount of Chlorine
Sample A	1.156 g	3.971 g
Sample B	1.542 g	5.297 g

Are sample A and sample B both samples of the same compound? Prove it! To solve it, think of everything we have said about compounds and atomic theory.